Product Data Sheet
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Smart Wireless Gateway 1552WU

- Gateway connects wireless self-organizing networks with any host system with integrated Wi-Fi backhaul
- Easy configuration and management of *Wireless*HART® self-organizing networks
- Easy integration into control systems and data applications through Wireless LAN connections
- Seamless integration into AMS™ Device Manager and DeltaV™ automation system
- Greater than 99% reliability of field wireless data integrity with industry proven security
- Smart Wireless capabilities extends the full benefit of PlantWeb™ architecture to previously inaccessible locations
- Secure field wireless communications built into *Wireless*HART
- Secure Wi-Fi communications provided by Cisco's defense-in-depth wireless Intrusion prevention solution

EMERSON.
Process Management

Smart Wireless Gateway and Access Point

Gain real-time process information with greater than 99% wireless field wireless data reliability.

- The Smart Wireless Gateway 15525WU automatically manages wireless communications in constantly changing environments for both Wi-Fi and *Wireless*HART.
- Native integration with DeltaV and Ovation automation systems provides simple and fast commissioning for wireless field networks.
- Connect to data historians, legacy host systems, and other via a LAN applications through Ethernet, Modbus, OPC, EtherNet/IP, and HART outputs.

Guarantee system availability with redundant gateway access points:

- Never lose the wireless network with hot standby capability and automatic fault detection.
- Gateway access points function as a single system, eliminating the need for duplicate host integration.
- One click configuration of the Gateway redundancy feature

Complete *Wireless*HART network configuration tools provided with each gateway access point

- The integrated web interface allows easy configuration of the wireless network and data integration without the need to install additional software.
- Complimentary AMS Wireless Configurator software provides Emerson Device Dashboards to configure devices and view diagnostic data.
- Drag and drop device provisioning enables a secure method to add new wireless devices to the wireless field network.

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Emerson's Smart Field Wireless Solution

IEC 62591 (*Wireless*HART)... the industry standard

Self-organizing, adaptive mesh routing

- No wireless expertise required, network automatically finds the best communication paths
- The self-organizing, self-healing network manages multiple communication paths for any given device. If an obstruction is introduced into the network, data will continue to flow because the device already has other established paths. The network will then lay in more communication paths as needed for that device.

Reliable wireless architecture

- Standard IEEE 802.15.4 radios
- 2.4 GHz ISM band sliced into 15 radio-channels
- Time Synchronized Channel Hopping to avoid interference from other radios, WiFi, and EMC sources and increase reliability
- Direct sequence spread spectrum (DSSS) technology delivers high reliability in challenging radio environment.

Emerson's Smart Wireless

Seamless integration via a LAN to all existing host systems

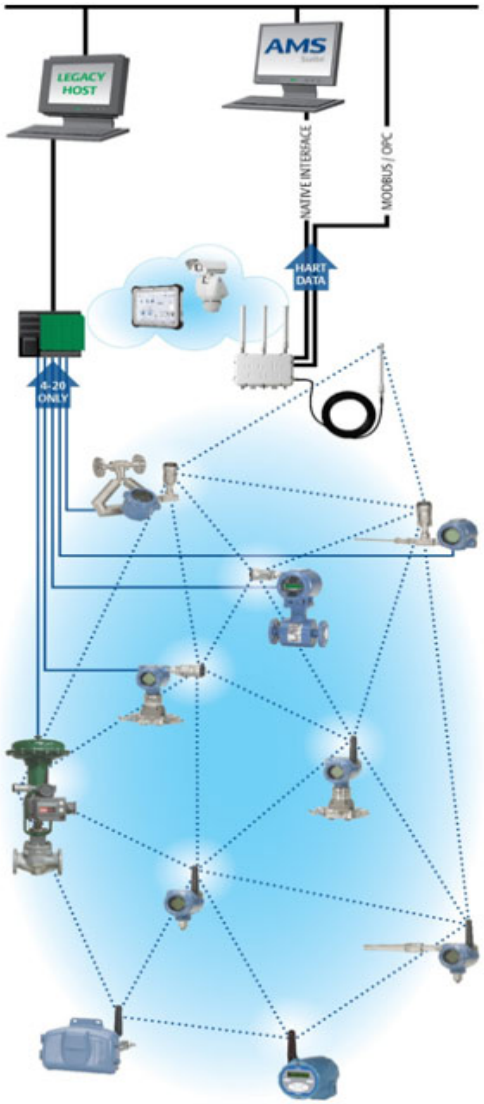
- Native integration into DeltaV and Ovation is transparent and seamless
- Gateways interface with existing host systems via a LAN, using industry standard protocols including OPC, Modbus TCP/IP, and EtherNet/IP

Layered security keeps your network safe

- Ensures that data transmissions are received only by the Smart Wireless Gateway
- Network devices implement industry standard Encryption, Authentication, Verification, Anti-Jamming, and Key Management
- Third party security verification including Achilles and FIPS197- User based login and enforced password strength. Password strength monitoring, user based log in, password reset requirements, automatic lockout, password expiration requirements. Based on guidelines from ISA99.03.03 standard approved level two.

SmartPower™ Solutions

- Optimized Emerson instrumentation, both hardware and software, to extend power module life
- SmartPower technologies enable predictable power life



Emerson's Smart Plant Wireless Solution

Scalable

Emerson can provide a wireless network solution that exactly meets your needs today, while providing flexibility for future wireless mesh infrastructure growth as your needs expand. Emerson's Smart Wireless Plant Solutions can also scale to the types of applications you utilize in your wireless plant. For example, each Wi-Fi mesh node installed to backhaul *Wireless*HART® data can also be used as a "hot spot" for your mobile workers to access live plant data, to wirelessly stream video data, or track personnel with Wi-Fi RFID tags.

Reduced cost

When compared to the cost of engineering and trenching or pulling a fiber optic cable to each of the *Wireless*HART gateways, a fully integrated wireless backhaul solution can be deployed for less cost when the field network is separated from the control room by large distances, difficult terrain, or bodies of water.

Safer deployment

Trenching or pulling a fiber optic cable in a live process area puts workers in the process area for long periods of time - exposing them to potential hazards and risking disruptions to process operations.

Secure and reliable communications

All communications on the wireless plant network are fully secure using AES 128-bit encryption. The integrity of the wireless communication network is continuously monitored and alerts can be sent to administrators if degradation of the wireless signal is detected.

Wi-Fi defense-in-depth provided by Cisco's wireless Intrusion Prevention solution secures the Wi-Fi network from hackers, eavesdroppers, and ensures only authorized personnel have access to the resources they need.

Wireless engineering services

Wireless engineering services are critical to the success of a wireless plant network deployment. Emerson offers a comprehensive services portfolio to help you design and deploy a Wireless solution.

Site assessment (wireless FEED)

A site assessment is not needed for the *Wireless*HART field instrumentation network, but one will be required for the Wi-Fi network communications equipment being installed to provide good Wi-Fi coverage for the desired plant area.

For the Wi-Fi wireless FEED, Emerson engineers visit your plant site to conduct a Radio Frequency (RF) study, determine access point locations and collect other on-site information.

Network design and planning

Based on the site survey results and your control system requirements, Emerson engineers design the overall wireless mesh architecture including the detailed network infrastructure, network monitoring tools, and integrated security.

Physical network installation management

Engineers work with you to install the wireless mesh network equipment based on the detailed network design.

System commissioning

The wireless mesh network is brought online and commissioned onsite. Complete site acceptance testing is performed with your engineers.

Training

Emerson will work with you to specify a training curriculum that meets your specific needs.

Support

Emerson delivers SureService® wireless life-cycle services through our engineering centers and global service organizations. Emerson's wireless life cycle services are designed to help you maintain system uptime, apply wireless technology for better business results and preserve your intellectual and capital investment.

Additional wireless plant solutions

- **Mobile worker —** Depending on your needs, Emerson can provide Wi-Fi access throughout your process plant or just in specific locations to connect field personnel with Wi-Fi enabled PDAs or laptops to plant or office network applications.
- **Video —** Easily add video cameras in remote areas of your plant to monitor the process or site for emissions, safety and security.
- **Safety mustering —** Instead of taking a time-consuming role call in an emergency, a Safety Mustering solution can electronically determine the mustered status of all personnel in the process plant.
- **Location tracking —** Plant personnel can be tracked throughout the plant site with varying degrees of accuracy depending on your site's needs. Emerson's location tracking solution is flexible to provide a good, better, or best capability depending on your site's needs and budget.

Ordering information

For inquiries and ordering information, please contact your local Emerson sales office. Prior to order acceptance, Emerson will issue a written proposal for your review and approval to ensure that scope, deliverables, timing, and budget meet your needs and expectations.

For more information, please visit our website at http://www.EmersonProcess.com/SmartWireless.

Specifications

Functional specifications

Input power

24VDC 2.5 Amp nominal (19 - 30 VDC), 39 watts

12VDC nominal (11.4 - 15V DC) non-hazardous installations only

Environmental

Operating temperature: -40 to 55 °C (-40 to 131 °F) plus Solar Loading
Storage temperature: -50 to 85 °C (-58 to 185 °F)
Humidity: 0-100% (condensing)
Wind resistance:

- Up to 100 MPH sustained winds
- Up to 165 MPH wind gusts

Environmental ratings

- IP67
- NEMA Type 4

Compliance

Safety

- UL 60950-1, 2nd Edition
- CAN/CSA-C22.2 No. 60950-1, 2nd Edition
- IEC 60950-1, 2nd Edition
- EN 60950-1, 2nd Edition
- ANSI/ISA 12.12.01
- CSA C22.2 No 213
- IEC/EN 60079-0
- IEC/EN 60079-15
- CSA: Class I, Division 2, Groups A, B, C and D
- ATEX: Class I, Zone 2; Ex nA II, T5

Immunity

- ≤ 5 mJ for 6kV/3kA @ 8/20 ms waveform
- ANSI/IEEE C62.41
- EN61000-4-5 Level 4 AC Surge Immunity
- EN61000-4-4 Level 4 Electrical Fast Transient Burst Immunity
- EN61000-4-3 Level 4 EMC Field Immunity
- EN61000-4-2 Level 4 ESD Immunity
- EN60950 Overvoltage Category IV

Radio approvals

- FCC Part 15.247, 15.407
- FCC Bulletin OET-65C
- RSS-210
- RSS-102
- AS/NZS 4268.2003
- EN 300 328
- EN 301 893

EMI and susceptibility

- FCC part 15.107, 15.109
- ICES-003
- EN 301 489-1, -17

Communication specifications

Wiring: Cat5E shielded cable. Wiring distance 328 ft. (100 m).

Ethernet

10/100/1000BASE-T Ethernet, autosensing (RJ-45)

Maximum transmit power for Wi-Fi

2.4 GHz

- 802.11b (Complementary Code Keying [CCK])
  - 28 dBm with 2 antennas
- 802.11g (non HT duplicate mode)
  - 28 dBm with 2 antennas
- 802.11n (HT20)
  - 28 dBm with 2 antennas
- 802.15.4
  - 18 dBm with 1 antenna

5 GHz

- 802.11a
  - 28 dBm with 2 antennas
- 802.11n non-HT duplicate (802.11a duplicate) mode
  - 28 dBm with 2 antennas
- 802.11n (HT20)
  - 27 dBm with 2 antennas
- 802.11n (HT40)
  - 27 dBm with 2 antennas

Maximum transmit power from *Wireless*HART

Maximum of 10 mW (10 dBm) EIRP

EMC performance

Complies with EN61326-1:2006.

Wi-Fi antenna options

The 1552WU has six external Type N connectors for Wi-Fi antennas: Three for 2.4 GHz and three for 5 GHz. These IP66 rated antennas may be connected directly, or via an appropriate cable. The following Cisco antennas are supported:

- AIR-ANT2480V-N (2.4 GHz, 8 dBi, omni, 19.5" long)
- AIR-ANT5180V-N (5 GHz, 8 dBi, omni, 11" long)
- AIR-ANT5114P2M-N= (5 GHz, 14 dBi, dual polarized patch)

*Wireless*HART antenna

Remote mount Omnidirectional Antenna (2.4GHz, 6 dBi) connected with a 50' low loss cable.

Physical specifications

Dimensions (W x L x H)

12.0 in. x 7.8 in. x 6.4 in. (30.48 cm x 19.81 cm x 16.26 cm) (including antenna mount)

Weight

1552WU: 17.6 lb (8 kg)
Pole mounting bracket: 6.1 lb (2.8 kg)

Material of construction

Housing: Aluminum, NEMA 4
Paint: Powder coat paint over Alodine finish plating
Cover Gasket: Silicone tube
Remote Antenna: Fiber Glass

Certifications

- CSA: Class I, Division 2, Groups A, B, C and D
- ATEX: Class I, Zone 2; Ex nA II, T5

802.11n capabilities

2 x 3 multiple-input multiple-output (MIMO) with two spatial streams
Legacy beamforming
20- and 40-MHz channels
PHY data rates up to 300 Mbps
Packet aggregation: A-MPDU (Tx/Rx), A-MSDU (Tx/Rx)
802.11 dynamic frequency selection (DFS)
Cyclic shift diversity (CSD) support

Self-organizing field network specifications

Protocol

IEC 62591 (*Wireless*HART), 2.4 - 2.5 GHz DSSS

Maximum network size

100 wireless devices @ 8 sec. or higher
50 wireless devices @ 4 sec.
25 wireless devices @ 2 sec.
12 wireless devices @ 1 sec.

Supported device update rates

1, 2, 4, 8, 16, 32 seconds or 1 - 60 minutes

Network size/latency

100 Devices: less than 10 sec.
50 Devices: less than 5 sec.

Data reliability

> 99%

Gateway protocols:

Modbus

Supports Modbus TCP with 32-bit floating point values, integers, and scaled integers.
Modbus Registers are user-specified.

OPC

OPC server supports OPC DA v2, v3

EtherNet/IP

Supports EtherNet/IP protocol with 32 bit Floating Point values and Integers.
EtherNet/IP Assembly Input-Output instances are user configurable.
EtherNet/IP specifications are managed and distributed by ODVA.

Wi-Fi security

Security

- Wireless bridging/mesh
  - X.509 digital certificates
  - MAC address authentication
  - Advanced Encryption Standards (AES), Temporal Key Integrity Protocol (TLIP)
- Wireless access
  - 802.11i, Wi-Fi Protected Access (WPA2), WPA
  - 802.1X authentication, including Extensible Authentication Protocol and Protected EAP (EAP-PEAP), EAP Transport Lauer Security (EAP-TLS), EAP-Tunneled TLS (EAP-TTLS), and Cisco LEAP
  - Advanced Encryption Standards (AES), Temporal Key Integrity Protocol (TLIP)
  - VPN passthrough
  - IP Security (IPsec), Layer 2 Tunneling Protocol (L2TP)
  - MAC address filtering

Gateway system security specifications

Ethernet

Secure Sockets Layer (SSL) - enabled (default) TCP/IP communications

Smart Wireless Gateway access

Role-based Access Control (RBAC) including Administrator, Maintenance, Operator, and Executive. Administrator has complete control of the gateway and connections to host systems and the self-organizing network.

Self-organizing network

AES-128 Encrypted *Wireless*HART including individual session keys. Drag and Drop device provisioning, including unique join keys and white listing.

Internal firewall

User Configurable TCP ports for communications protocols, including Enable/Disable and user specified port numbers. Inspects both incoming and outgoing packets.

Third party certification

Wurldtech: Achilles Level 1 certified for network resiliency

National Institute of Standards and Technology (NIST): Advanced Encryption Standard (AES) Algorithm conforming to Federal Information Processing Standard Publication 197 (FIPS-197)

Product Certifications

Telecommunications Compliance

All wireless devices require certification to ensure that they adhere to regulations regarding the use of the RF spectrum. Nearly every country requires this type of product certification. Emerson and Cisco are working with governmental agencies around the world to supply fully compliant products and remove the risk of violating country directives or laws governing wireless device usage.

FCC and IC

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions. This device may not cause harmful interference. This device must accept any interference received, including interference that may cause undesired operation. This device must be installed to ensure a minimum antenna separation distance of 20 cm from all persons.

Ordinary Location Certification for CSA

As standard, the 1552WU has been examined and tested to determine that the design meets basic electrical, mechanical, and fire protection requirements by CSA, a nationally recognized testing laboratory (NRTL) as accredited by the Federal Occupational Safety and Health Administration (OSHA).

North America

CSA Division 2, Non-Incendive
Certificate: 1945576
Suitable for Class I, Division 2, Groups A, B, C, and D.
Ambient Temperature: T5(-40 °C to +55 °C)
CSA Enclosure Type 4

European Union Directive Information

The EC declaration of conformity for all applicable European directives for this product can be found on the Emerson website at www.emerson.com. A hard copy may be obtained by contacting your local sales representative.

Europe

ATEX Type n
Certificate: Sira 11ATEX4253
ATEX Marking: II 3 G
Ex nA II T5(T_a = -40 °C to +55 °C)

Special Condition for Safe Use (X):

The surface resistivity of the antenna is greater than one gigaohm. To avoid electrostatic charge build-up, it must not be rubbed or cleaned with solvents or a dry cloth.

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